

# FlexOfom®

## The Polyethylene Foam for Thermal Insulation in Cooling Engineering

**FlexOfom®** low density polyethylene foam is a flexible material that is easy to use and is cost effective for thermal insulation. A thermal insulation material prevents the transfer of heat primarily by conduction. The foam has a very fine closed cell structure. Thus, the heat transfer from one side of the foam surface to the other side is reduced.



### **NEW ENGINEERING SDN BHD**

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Manufacturer/Exporter of quality EVA/PE foams for thermal insulation, packaging, engineering, construction, agriculture, garments, baggage, sport-gear, footwear and toys.

# PRODUCT FEATURES OF FlexOfom®

- The polyethylene foam has stable thermal conductivity (K value) during service due its very fine closed cell characteristic.
- The foam is weather resistant and will not crack when used in pipe insulation exposed to weather over time. It has no fibre that will cause health hazard.
- The foam has a flame retardant property.
- The foam is resistant to moisture and vapour without using additional vapour barrier (eg. aluminium foil).
- The thin foam sheet used in air-conditioning duct works can be conveniently installed without excessive space allowance and without additional vapour barrier. This reduces space requirements in the ceiling and also the inter-floor height thus overcoming tight space constraints.
- The foam can be used as a decoration feature, when used on air-conditioning duct works where ceiling is absent, as it can be of any colour.
- The foam makes installation works easy, neat and fast, as it is flexible maerial. It can be glued to ducts in the factory or to ducts on the ground at site or to ducts already erected in the ceiling.
- The cost of using the foam for insulation ductworks is economical as its installation is easy and fast and no costly additional vapour barrier (eg. aluminium foil) is required.

## RECOMMENDED THICKENSS FOR COOLING ENGINEERING

Air Conditions	Metal Surface Temperature			
	15°C (59°F)	12°C (53.6°F)	10°C (50°F)	5°C (41°F)
<b>26.7°C (80°F)</b> 60% RH 70% RH	5 mm 5 mm	5 mm 6 mm	5 mm 8 mm	8 mm 12 mm
<b>29.4°C (85°F)</b> 60% RH 70% RH	5 mm 8 mm	6 mm 10 mm	8 mm 10 mm	10 mm 14 mm

# COMPARISON AND STRUCTURE OF VARIOUS THERMAL INSULATIONS USED IN COOLING ENGINEERING

- **OPEN CELL INSULATION:** *Glass fibre, Rock Wool and Calcium Silicate.*

The fibre usually contains air pockets which are open to each other. Water and vapour can easily pass through the fibre. Water and vapour can be trapped in the fibre and leads to deterioration of the insulation. Some loose fibre particles for certain types insulation materials in the room atmosphere can be a health hazard to the room occupants over a long period of time.

- **INTERCONNECTING CELL INSULATION:** *Polystyrene foam and cork.*

The small foam beads are compressed together. Water and vapour in the insulation is more difficult to penetrate than Open Cell Insulation. The degree of penetration of vapour depends on the density of the foam. Vapour barrier material must be used and condensation can still occur if the installation is not properly done. The rigidity of the foam can make installation more difficult for curved areas.

- **SEMI OPEN CELL INSULATION:** *Polyurethane foam, non-cross-linked polyethylene foam and phenolic foam.*

Most of the tiny independent cells are not perfectly closed and thus the insulation can absorb water (more than 10% by weight). This is more particularly so when the foam has a low density. The rigidity and the thin walled cells in the foam enable the insulation to deteriorate easily; therefore the high vapour penetration cause a shorter service life in the insulation material.

- **CLOSED CELL INSULATION:** *Cross-linked polyethylene (eg. FlexOfom®) and Nitrile-PVC foam.*

The complete independent closed cells reduced water and vapour penetration (less than 5% by weight). This kind of insulation has the lowest water absorption (FlexOfom® 2% by JIS K6767 because of its very fine closed cells) and lowest water vapour transmission (FlexOfom® 1.044g/hm<sup>2</sup> at 90% Relative Humidity at 38°C by ASTM E 96-80) when compared with other thermal insulations described above. Generally, no vapour barrier material is necessary as condensation of vapour is minimum. The thermal conductivity of these foams is very stable even after a long period of service.